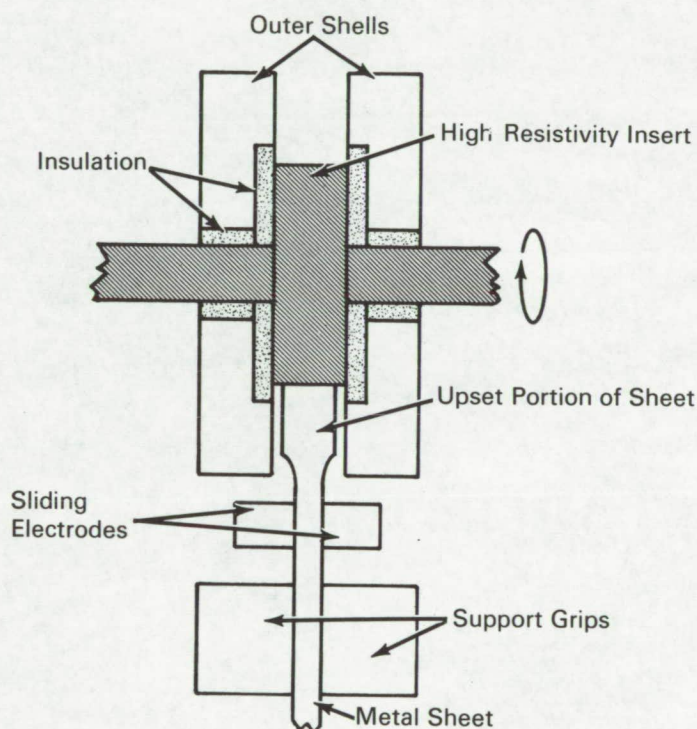


# NASA TECH BRIEF



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## Electrical Upsetting of Metal Sheet Forms Weld Edge



### The problem:

To provide metal sheets in the form of gore sections with heavier edge areas that can be welded without loss of strength. Present methods of milling out all but the edge areas of metal plates are expensive in both material and time consumed.

### The solution:

Electric gathering of sheet stock edges by progressive resistance heating and upsetting, and forming the edges automatically.

### How it's done:

Sliding copper alloy electrodes apply low voltage, high amperage power to the sheet stock that is held in support grips that provide rigidity during the upsetting operation. A forming roll that performs the upsetting function consists of two outer shells that are joined by insulation to a high electrical-resistivity center insert. Current from the sliding electrodes passes through the sheet and into the forming roll insert whose high resistivity retards the current passage and increases its heating efficiency. Hydraulic

(continued overleaf)

pressure enables the forming roll to upset the sheet stock at a definite yield point corresponding to a forming temperature of approximately 600°-650°F.

**Notes:**

1. Pressure and thermal (current) input are first determined in order to arrive at the optimum upset speed. Final settings are fixed and not affected by minor variations in chemistry or dimension of the stock being upset.
2. This process avoids disturbance of the metal's internal structure, an inherent byproduct of chemically milled plates.

3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama, 35812  
Reference: B66-10248

**Patent status:**

No patent action is contemplated by NASA.

Source: Emil S. Scherba  
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